

*Cited reference 6 (Abstract)*  
**PATENT ABSTRACTS OF JAPAN**

(11)Publication number : 10-106478

(43)Date of publication of application : 24.04.1998

(51)Int.Cl.

H01J 37/317

H01L 21/265

(21)Application number : 08-281362

(71)Applicant : TOKYO ELECTRON LTD  
BARIAN JAPAN KK

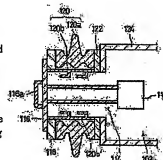
(22)Date of filing : 02.10.1996

(72)Inventor : TAKAZOE TOSHIHIKO

**(54) ION IMPLANTING DEVICE****(57)Abstract:**

**PROBLEM TO BE SOLVED:** To provide an ion implanting device allowing the easy change of a bushing and the extension of the replacement period of the bushing.

**SOLUTION:** A bushing 120 laid between a support plate 116 for bearing an ion source 112 and an ion beam generation vessel 124 is formed out of the first bushing 120a to be fixed and the second bushing 120b to be replaced. Also, a projection 120b' is formed on the inner wall of the second bushing 120b, and the prescribed groove is formed on the projection 120b' at the side different from an ion beam takeout direction. As a result, when a reaction product adheres to the inner wall of the second bushing 120b and electrical conductivity takes place, the change of only the second bushing 120b is required, thereby allowing an easy replacement work. Furthermore, the formation of the projection 120b' and the groove extends the replacement period of the second bushing 120b and a throughput is improved.



Cited Reference 1 (Abstract)

## PATENT ABSTRACTS OF JAPAN

(11)Publication number: 11-329336  
 (43)Date of publication of application: 30.11.1999

(51)Int.Cl.

H01J 37/317

H01J 37/16

H01L 21/265

(21)Application number: 10-146574

(71)Applicant: NISSIN ELECTRIC CO LTD

(22)Date of filing: 11.05.1998

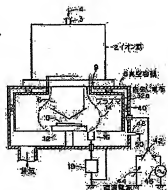
(72)Inventor: ANDO YASUNORI  
 MAENO SHUICHI  
 MATSUDA YASUHIRO

## (54) ION IMPLANTER

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To stabilize plasma potential to heighten stability of ion beam current measurement by a Faraday device, in a device performing both ion implantation into a substrate, and generation of plasma in the area including the vicinity of the surface of the substrate.

**SOLUTION:** A cylindrical lining electrode 32a is arranged along the inside wall of a vacuum container 8 so as to cover the inside wall in the area from the periphery of a substrate holder 12 to the vicinity of a mounting hole 9 of an ion source 2. The lining electrode 32a is electrically insulated from the vacuum container 8 and supported by insulators 40. Further, the lining electrode 32a is impressed with negative direct-current voltage by a direct-current power supply 44.



Cited Reference 3 (Abstract)

## PATENT ABSTRACTS OF JAPAN

(11)Publication number: 2000-340165

(43)Date of publication of application: 08.12.2000

(51)Int.Cl.

H01J 37/317

G23C 14/48

H01J 27/02

H01J 37/08

H01L 21/265

(21)Application number: 11-148141

(71)Applicant: ISHIKAWAJIMA HARIMA HEAVY IND GO LTD

(22)Date of filing: 27.05.1999

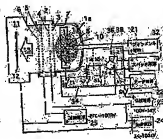
(72)Inventor: KAWASAKI YOSHINORI  
NAKAMOTO ICHIRO  
KUWABARA HAJIME

## (54) SELF-CLEANING ION DOPING DEVICE AND METHOD THEREOF

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To clean an anode electrode without opening a device to the atmosphere by providing a first switching device capable of switching the positive electrode of an arc power source to a chamber internal wall, a second switching device capable of connecting and cutting off the positive electrode of a sputter power source for sputtering the anode electrode, to and from the positive electrode of the arc power source, and a third switching device capable of switching a negative electrode to the anode electrode.

**SOLUTION:** The positive electrode of an arc power source 22 is switched to an ion source internal wall 1a by a first switching device 34, and the positive electrode of a sputter power source is connected to the positive electrode of the arc power source by a second switching device 36, the negative electrode of the sputter power source is switched to an anode electrode by a third switching device 38 to generate plasma between the ion source internal wall 1a and filaments 8. Using this plasma, sputtering is applied to the anode electrode impressed to negative, to eliminate a deposit on the anode electrode to obtain an excellent ion source characteristic. In the sputter power source 32, it is preferable that bias voltage to the positive electrode of the arc power source 22 is 0-1000 V.



Cited Reference 4 (Abstract)  
**PATENT ABSTRACTS OF JAPAN**

(11)Publication number : 63-126225  
(43)Date of publication of application : 30.05.1988

(51)Int.Cl.

H01L 21/302

H01J 37/32

(21)Application number : 61-272443  
(22)Date of filing : 15.11.1986

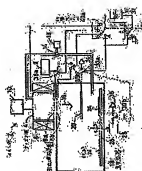
(71)Applicant : NISSIN ELECTRIC CO LTD  
(72)Inventor : SASAMURA YOSHITAKA  
NAKAZATO HIROSHI

**(54) ETCHING DEVICE**

**(57)Abstract:**

**PURPOSE:** To enable a vacuum chamber to be cleaned up without removing an ion source from the vacuum chamber by a method wherein a plasma producing means and a transfer means to produce plasma as cleaning gas serving both as a part of plasma producing means are provided.

**CONSTITUTION:** Multiple specimens 24 are mounted on the peripheral part of rapidly turning disc 26 provided in a vacuum chamber 18. Then, respective specimens 24 are successively ion beam-etched by irradiating with ion beams 16 from an ion source 2. On the other hand, during the ion etching process, a shutter 20 is shut up to impress the space between the shutter 20 and the disc 26 with high-frequency from a high-frequency power supply 32 so that plasma may be produced to successively etch the specimens 24. In order to clean up the ion source 2, the high-frequency impressed positions are located by properly selecting the positions of transfer switched 40a, 40b so that inner gas may be fed to remove any pollutant by sputtering process.



# ION SOURCE, CLEANING METHOD IN ION PROCESSING PROCESS

**Publication number:** JP11329266 (A)

**Publication date:** 1999-11-30

**Inventor(s):** GRAF MICHAEL ANTHONY; BENVENISTE VICTOR M

**Applicant(s):** EATON CORP

**Classification:**

- international: H01J27/02; C23C14/48; H01J27/04; H01J37/08; H01J37/317; H01L21/265; C23C14/48; H01J27/02; H01J37/08; H01J37/317; H01L21/02; (IPC1-7): H01J27/02; C23C14/48; H01J37/08; H01J37/317; H01L21/265

- European: H01J27/04

**Application number:** JP19990085773 19990329

**Priority number(s):** US19980049642 19980327

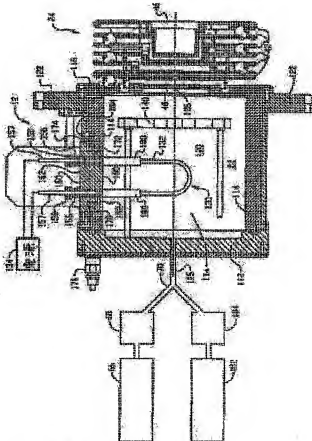
**Also published as:**

JP4126634 (B2)  
EP0945892 (A2)  
EP0945892 (A3)  
EP0945892 (B1)  
US6135128 (A)

more >>

**Abstract of JP 11329266 (A)**

**PROBLEM TO BE SOLVED:** To carry out cleaning during a processing process for an ion chamber. **SOLUTION:** An ion source 12 includes a plasma chamber formed by chamber walls 112, 114, 116 determining a boundary for an ionization zone 120, a dopant gas generating source 66 and a first mechanism portion 68 for introducing ionizable dopant gas into the plasma chamber, a cleaning gas generating source 182 and a second mechanism portion 184 for introducing cleaning gas into the plasma chamber, and an exciter 130 for supplying energy to the dopant gas and the cleaning gas to generate plasma inside the plasma chamber. The cleaning gas is separated, ionized components are separated from the dopant gas, and reaction with the ionized components is conducted so as to prevent the components contained in the dopant gas from being deposited on the chamber walls 112, 114, 116.



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